

# Why do a Clean-up Plan for Pigg River & Old Womans Creek Watersheds?



First Public  
Meeting

June 5, 2008

The Franklin  
Center

Rocky  
Mount, VA



I  
sid  
in

Healthy watersheds  
help prevent flooding  
and protect public  
infrastructure like  
bridges and roads.

Fencing my cattle from  
the stream not only

We have to keep our  
drinking water safe for  
us and future  
generations.

water,  
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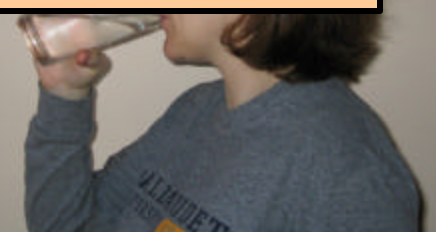
A health  
gr

**A Clean Pigg River is  
important to all of us for  
different reasons.**

Protecting our river is  
important because it  
is to save natural  
resources that everyone can  
enjoy.

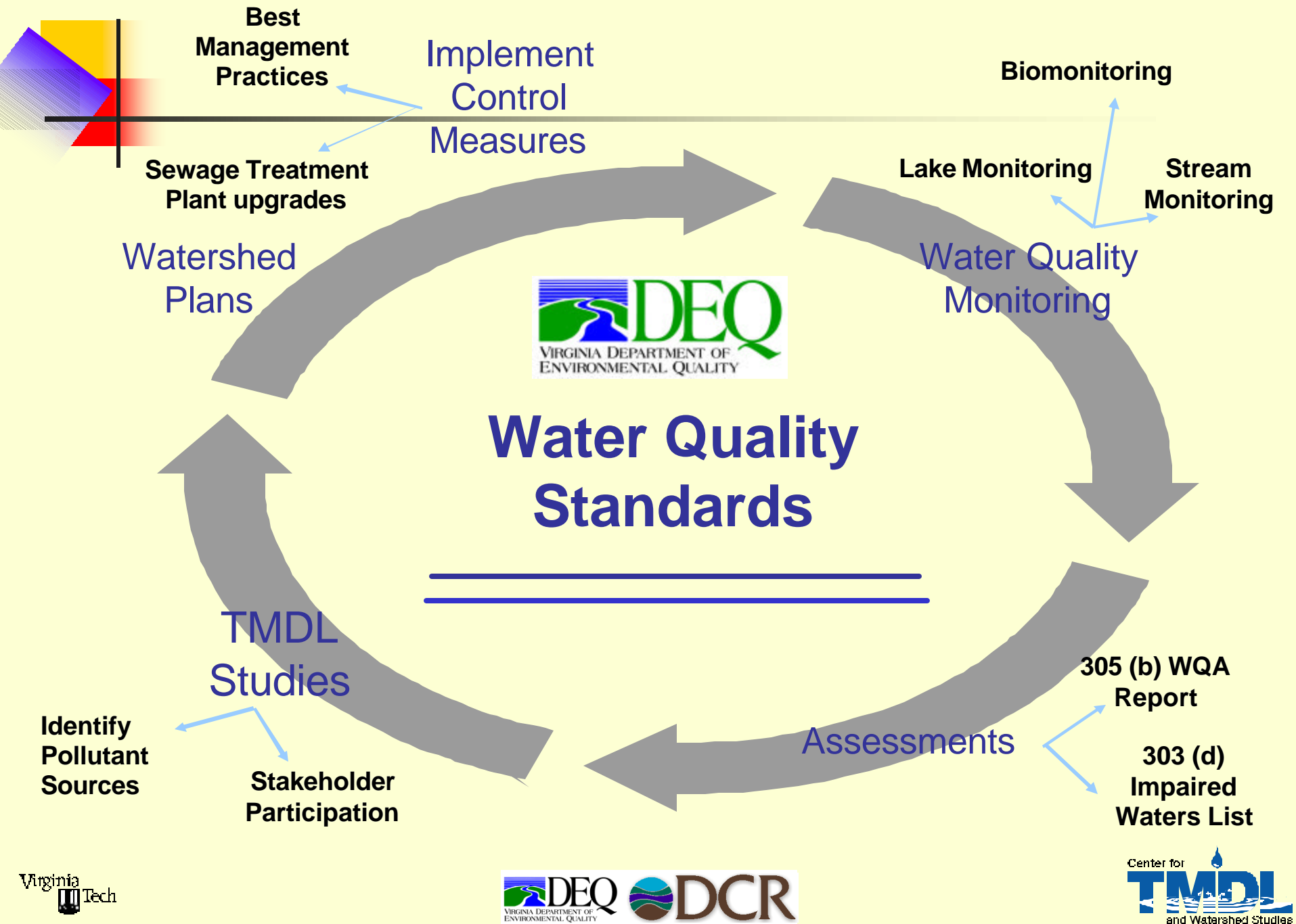


Streams are cool.

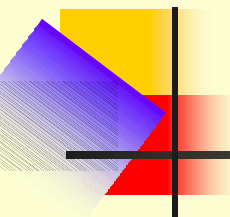


The trees, wildlife and  
open space were  
certainly big factors in  
our decision to pick this  
lot. We didn't mind  
paying a little more to  
live closer to nature.









# What is a TMDL?

- Total Maximum Daily Load (TMDL) is a term used to describe the amount of pollution a stream can receive and still meet Water Quality Standards.
  - Identify all sources of pollution contributing to violation of water quality standards.
  - Calculate the amount of pollutants entering the stream from each source.
  - Calculate the reductions in pollutants, by source, needed to attain/maintain water quality standards.



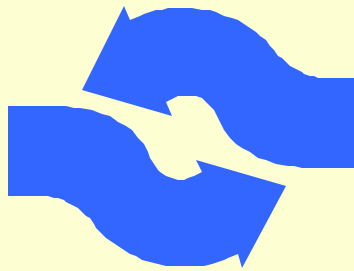


# Total Maximum Daily Loads (TMDLs) are Mandated by Law

- Federal 1972 Clean Water Act requires
  - Water Quality Monitoring
  - Periodic Assessment and Impaired Waters Listing
  - Develop TMDLs for Impaired Waters
- Virginia's 1997 Water Quality Monitoring Information and Restoration Act (WQMIRA) requires
  - TMDLs for Impaired Waters
  - An Implementation Plan
- 1999 Consent Degree with EPA to develop TMDL Reports for all 1998 listed streams by 2010

## TMDL- 3 Part Process:

- TMDL development
- Implementation Plan development
- Implement the plan



**Public  
Input!**

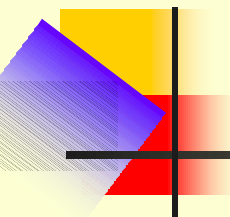


# Steps after EPA Approval

- Develop Implementation Plans
- Continue targeted Best Management Practices
- Continue stream monitoring  
DEQ, Citizen Monitoring







# Steps between EPA Approval and Implementation Plan Start-up

- Interim period between TMDL approval and Implementation Plan development
  - Promote implementation of Best Management Practices (BMPs)
  - Initiate educational outreach activities
  - Establish organizational framework for the Implementation Plan development
  - Identify and seek funding opportunities (i.e., grants)

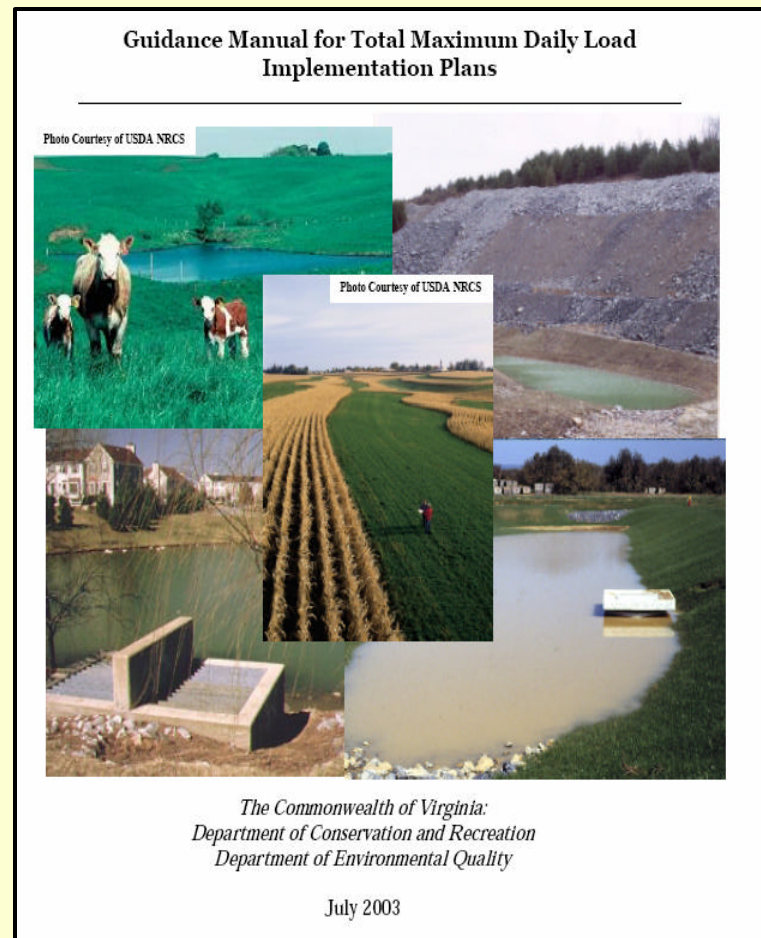
# Implementation Plan Development

- Implementation Plan development is required by state legislation (WQMIRA, 1997)
- DCR, DEQ, and other state, federal and local agencies will support plan development



# Implementation Plan Development

- Implementation Plan will be done locally
- Stakeholders will have the opportunity to participate in the plan development
  - Steering Committee, Working Groups
  - Public meetings
- Guidance Manual for Total Maximum Daily Load Implementation Plans

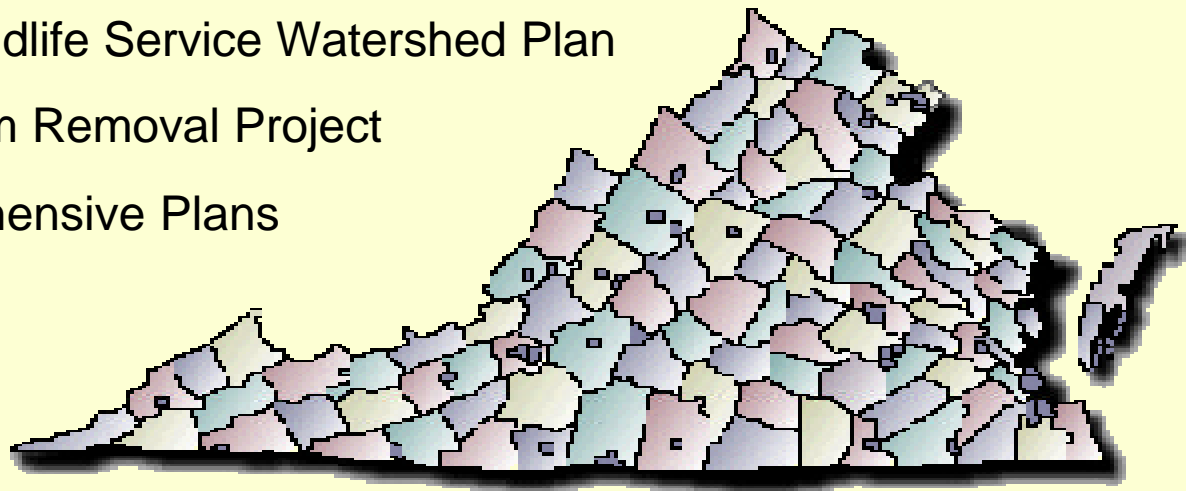


<http://www.deq.state.va.us/tmdl/implans/ipguide.pdf>



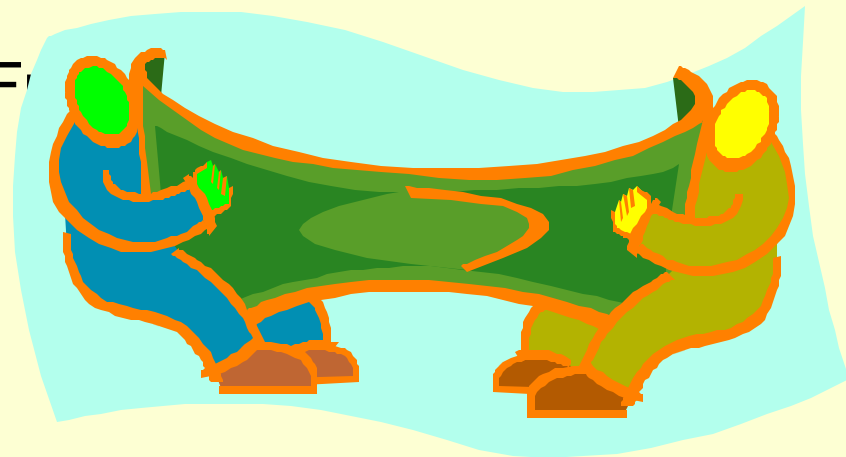
# Integration with other Watershed Plans

- Multiple water quality programs and activities may be underway in individual watersheds
- Each plan has specific geographical boundaries and goals
- TMDL implementation will be coordinated with other water quality plans/activities such as:
  - U.S. Fish & Wildlife Service Watershed Plan
  - Pigg River Dam Removal Project
  - Local Comprehensive Plans



# Potential Funding \$ource\$

- Potential funding sources for best management practices (BMPs) selected during Implementation Plan development:
  - USDA Programs - CREP/EQIP
  - WQIA projects
  - State Revolving Loan Fund
  - Cost-Share Program
  - Tax Credits

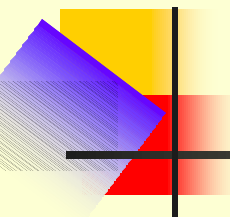




# Pigg River & Old Womans Creek Water Quality Improvement Status

- DEQ TMDL public meetings were held on:
  - August 16, 2005
  - October 27, 2005
  - March 9, 2006
- TMDL Report Approved by EPA September 2006
- Soil and Water Conservation Board Approval June 2007
- Blue Ridge and Pittsylvania Soil & Water Conservation Districts have been working with landowners to install water quality improvement projects!
- Informational Meeting held on May 1, 2008



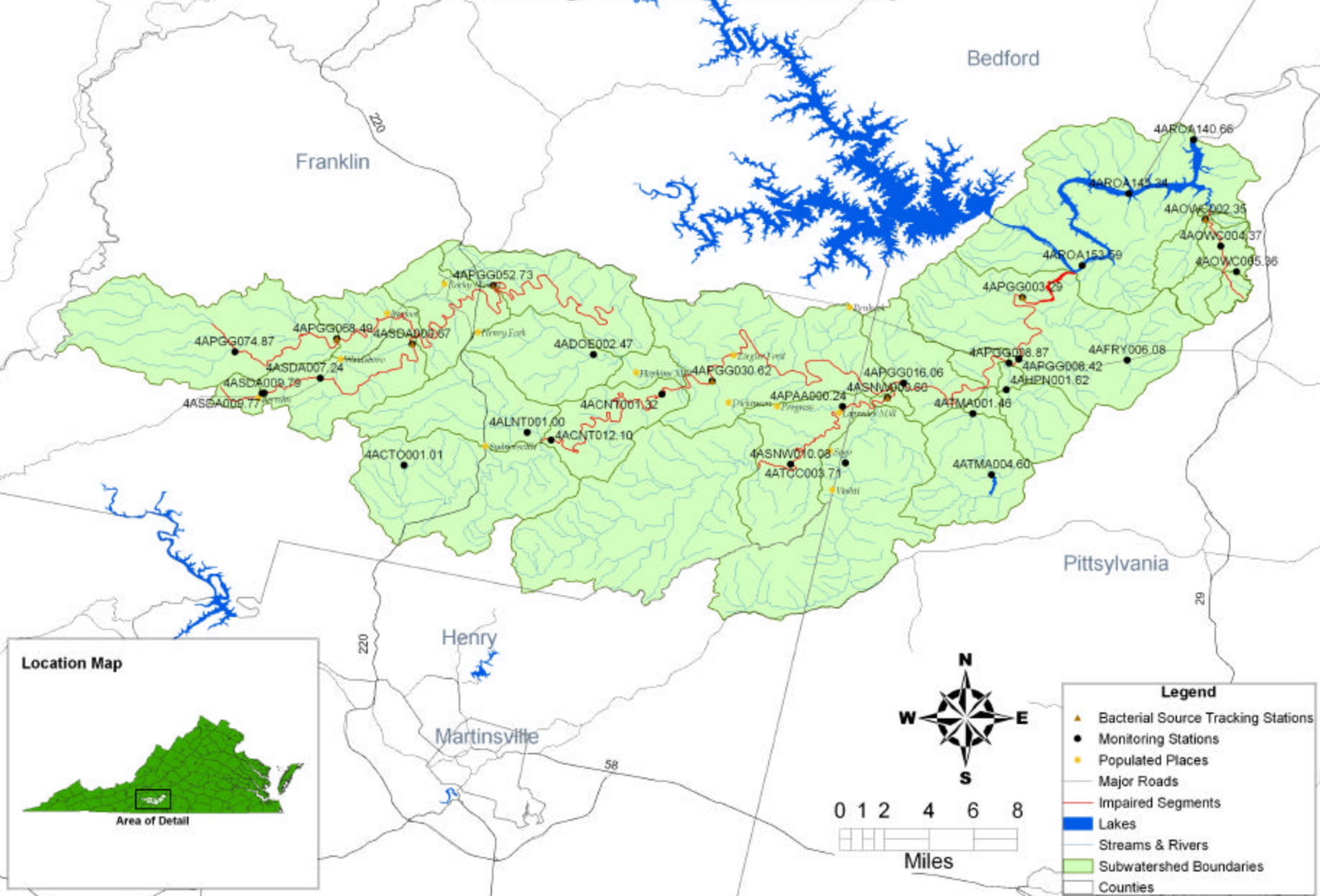


# Why do a TMDL Implementation Plan(IP)?

- Opportunity!
  - The implementation plan will open the door to funding that can fund technical assistance and the implementation of Agricultural and Urban BMPs (water quality improvement projects).
- Clean Water!
  - The ultimate goal of the Implementation plan is improving water quality through a cooperative partnership in the Pigg River & Old Womans Creek Watersheds.

# Pigg River TMDL Watersheds

(including Old Womans Creek)





# Objectives

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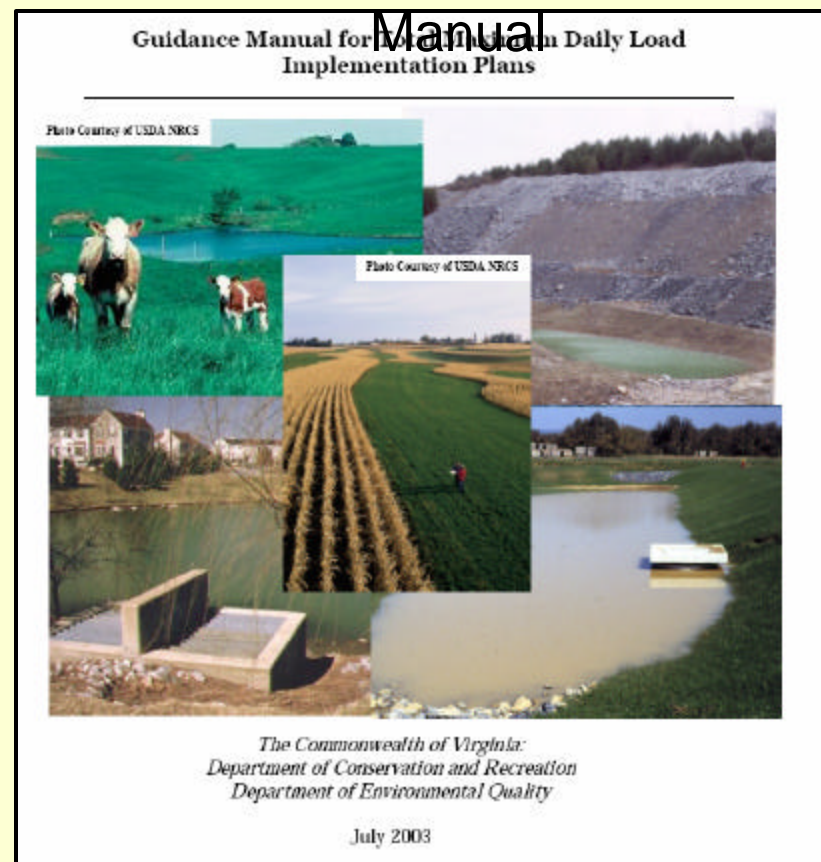
- Description of watershed
- Overview of bacteria source characterization
- Overview of TMDL development and Allocation Scenarios
- Description of TMDL Implementation Plan development process



# TMDL Implementation Plan

- Document that details actions or strategies that must be undertaken to achieve load reductions to ensure that water quality standards are met.

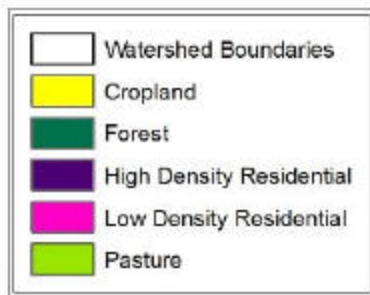
## Implementation Guidance



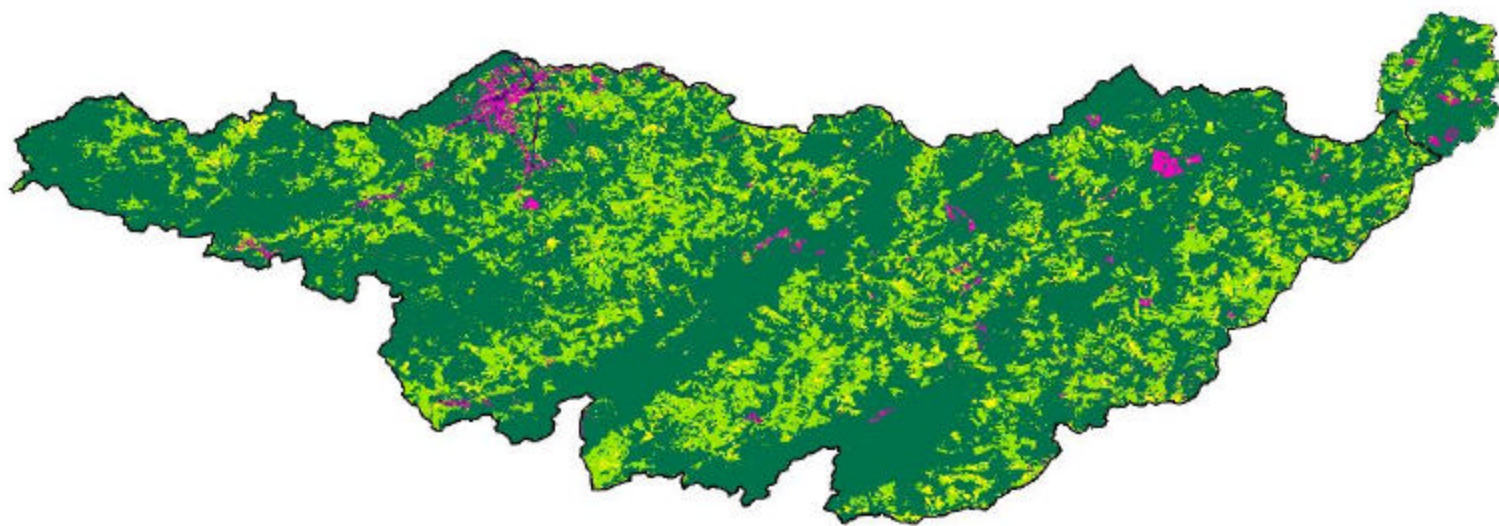
<http://www.deq.state.va.us/tmdl/implans/ipguide.pdf>

# Landuse Distribution

Watershed	Forest	Agriculture	Residential
Pigg River	72%	26%	2%
Snow Creek	71%	28%	1%
Story Creek	78%	20%	2%
Old Womans Creek	76%	24%	<1%

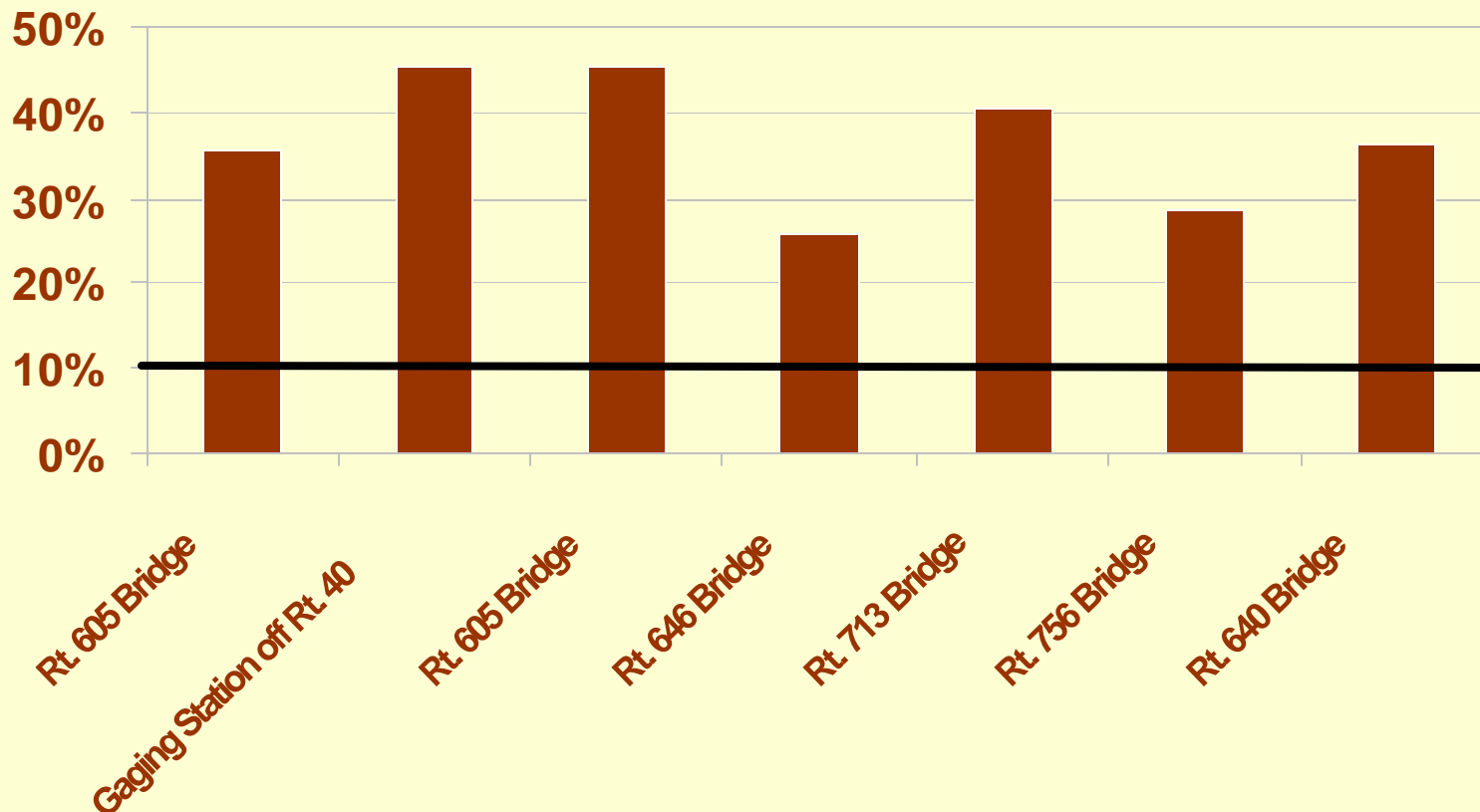


0 3.5 7 14 Miles



# Percent of Samples Exceeding Water Quality Standard

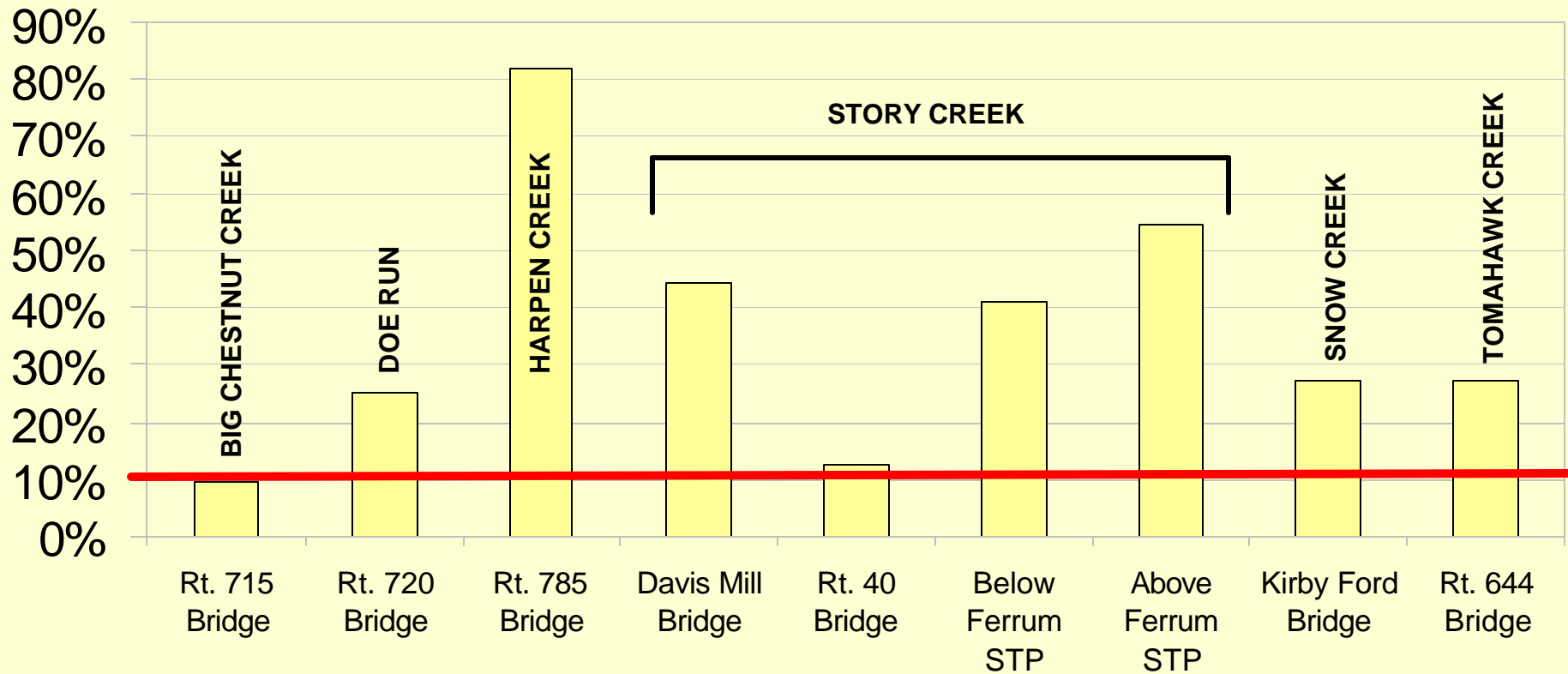
## Pigg River - Fecal Coliform Violation Rates



## DEQ Monitoring Station

# Percent of Samples Exceeding Water Quality Standard

## Fecal Coliform Violation Rates



**DEQ Monitoring Station Location**

# Sources and Distribution of Bacteria

**Livestock**

**Wildlife**

Crops

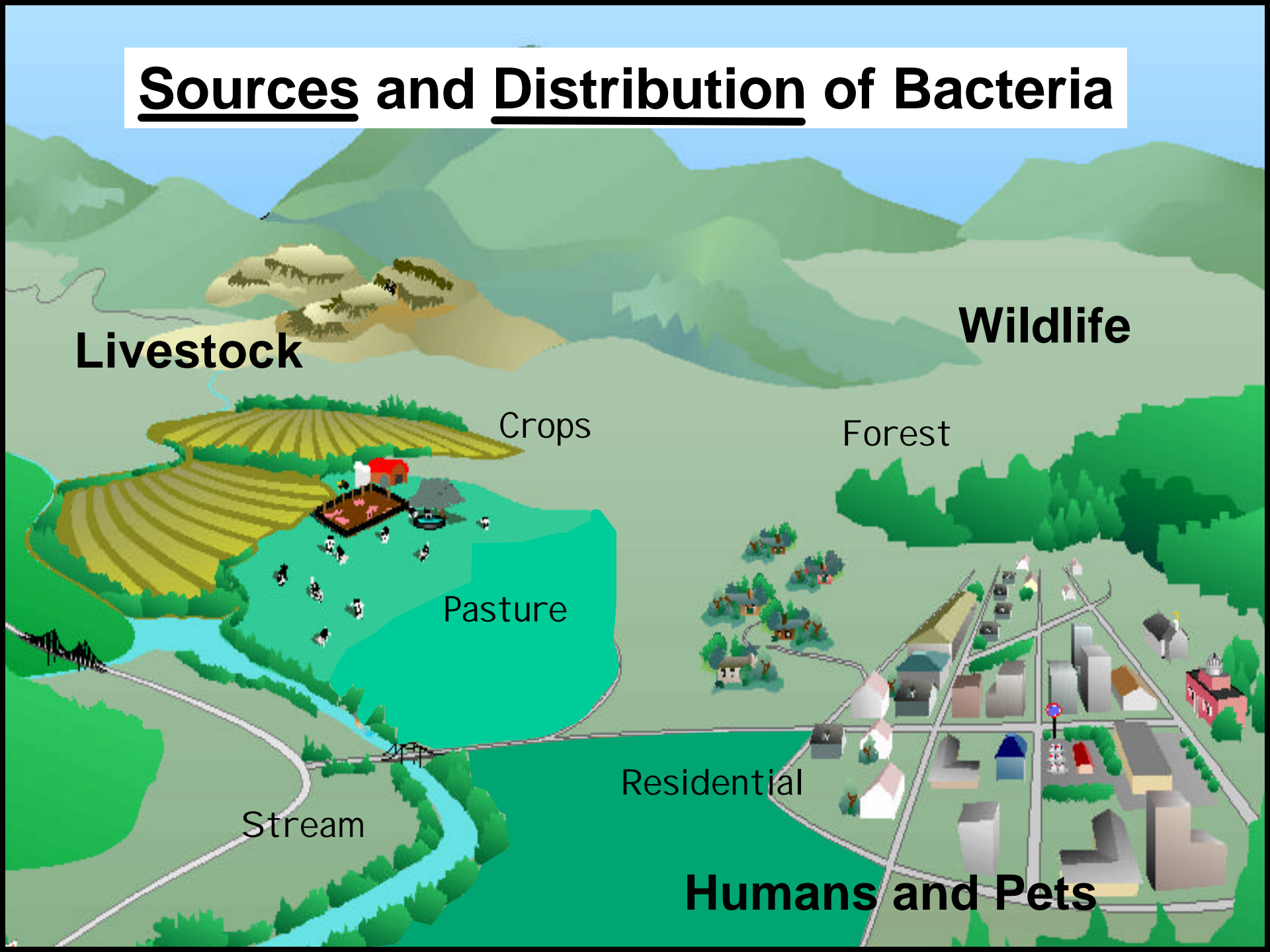
Forest

Pasture

Residential

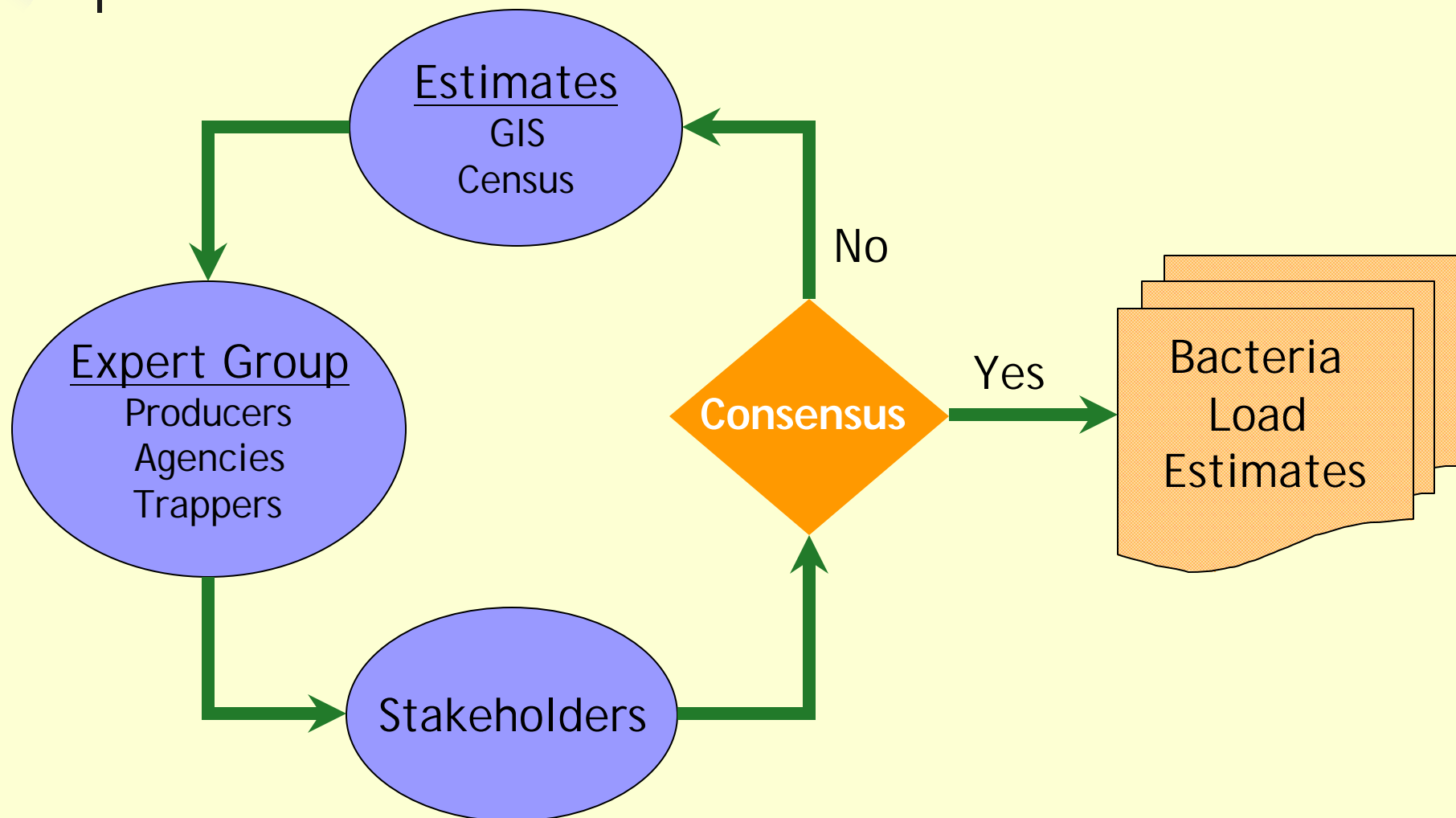
Stream

**Humans and Pets**



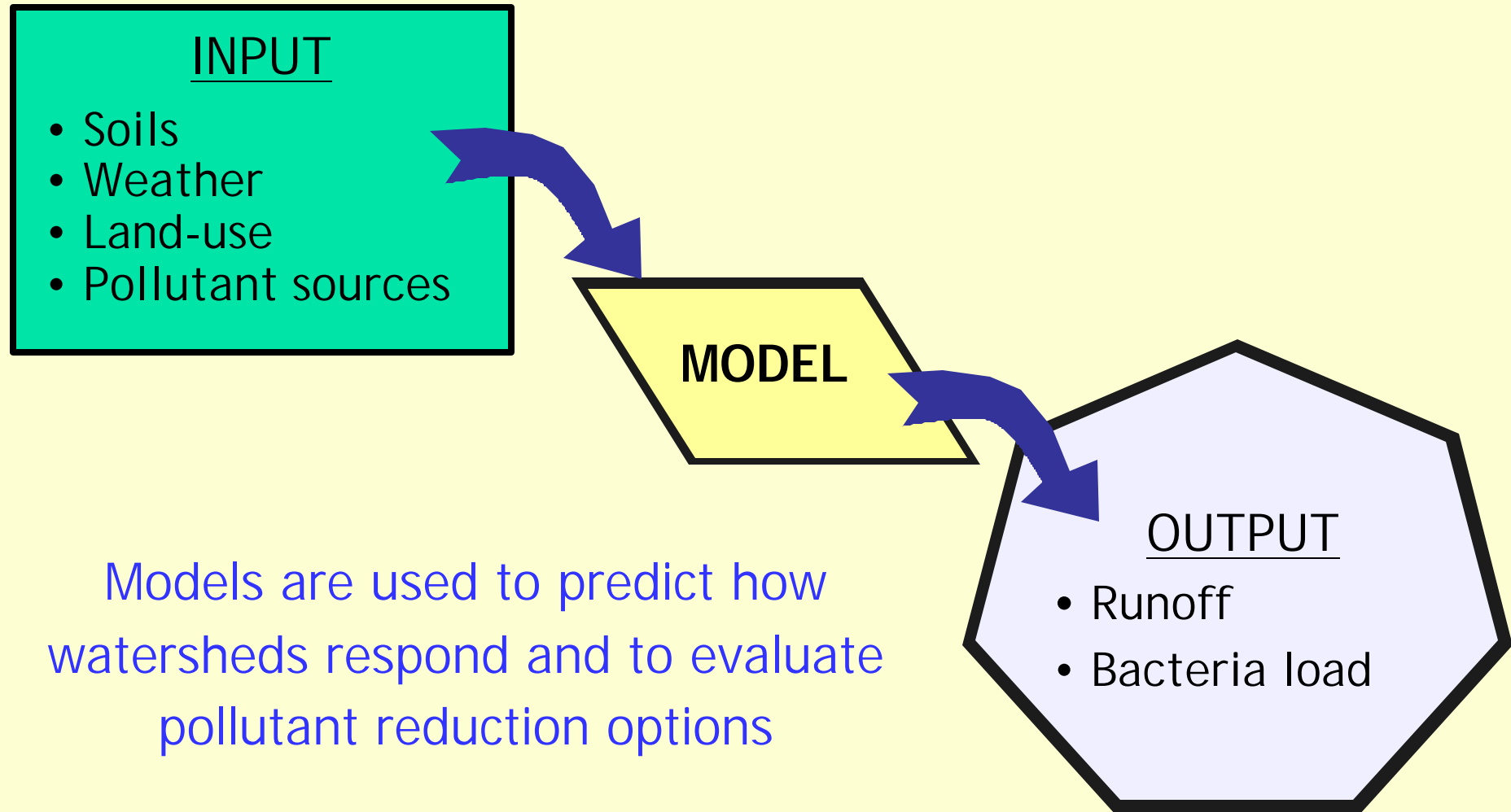


# Bacteria Source Characterization

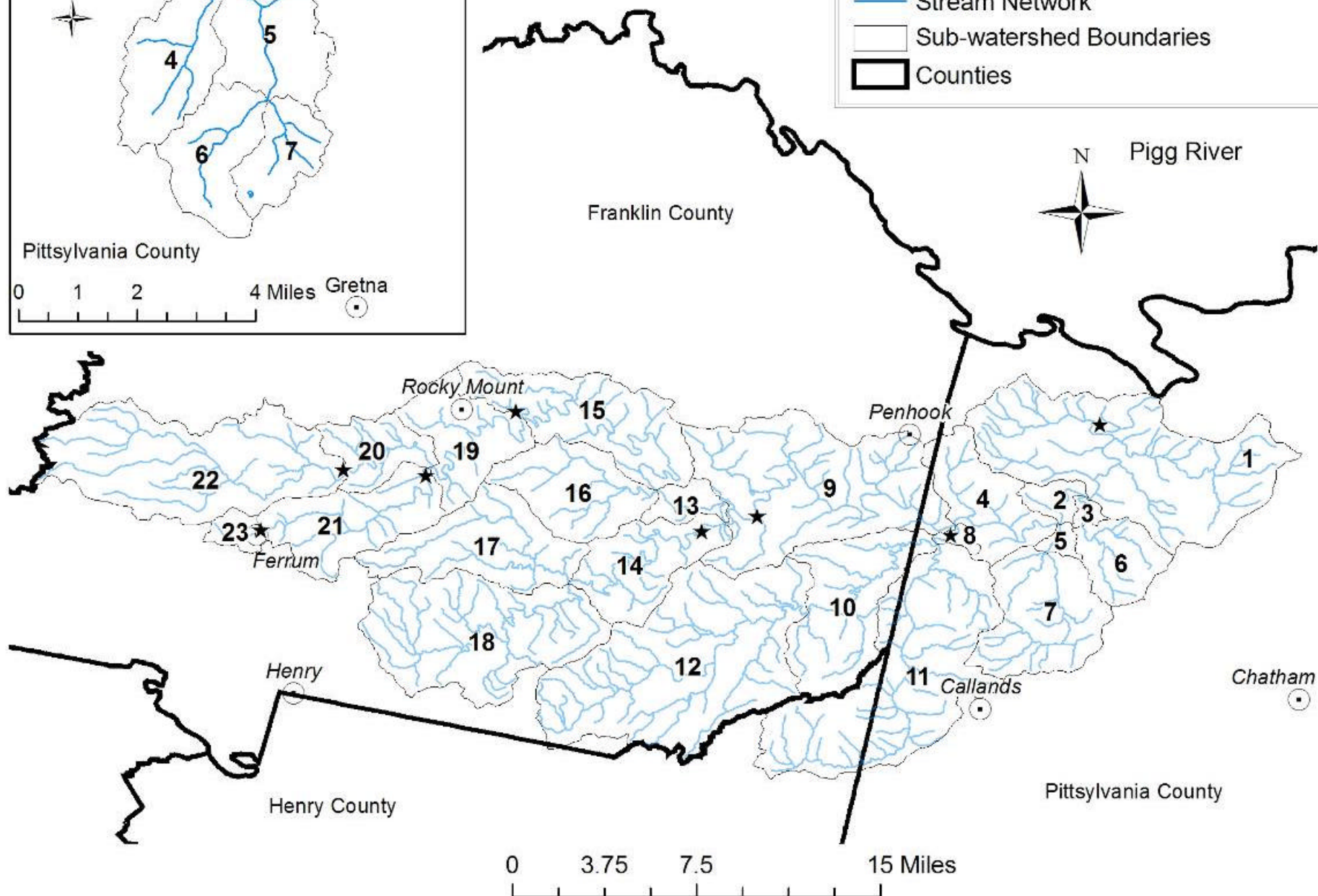
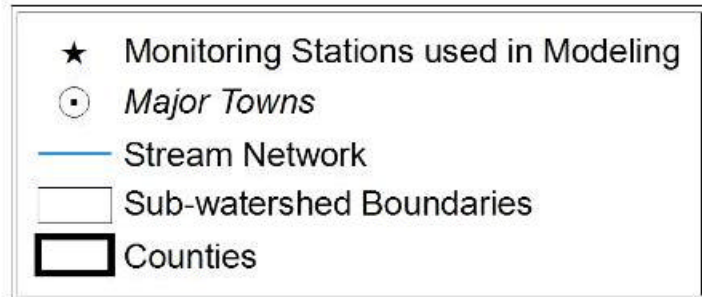
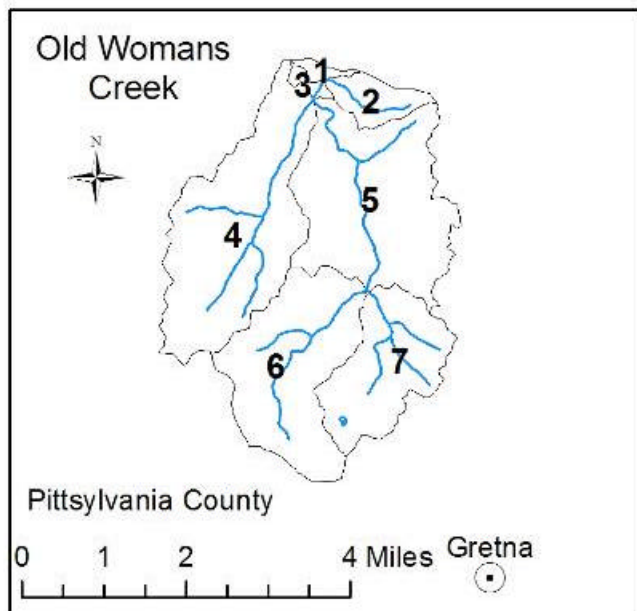




# Linking sources to water quality



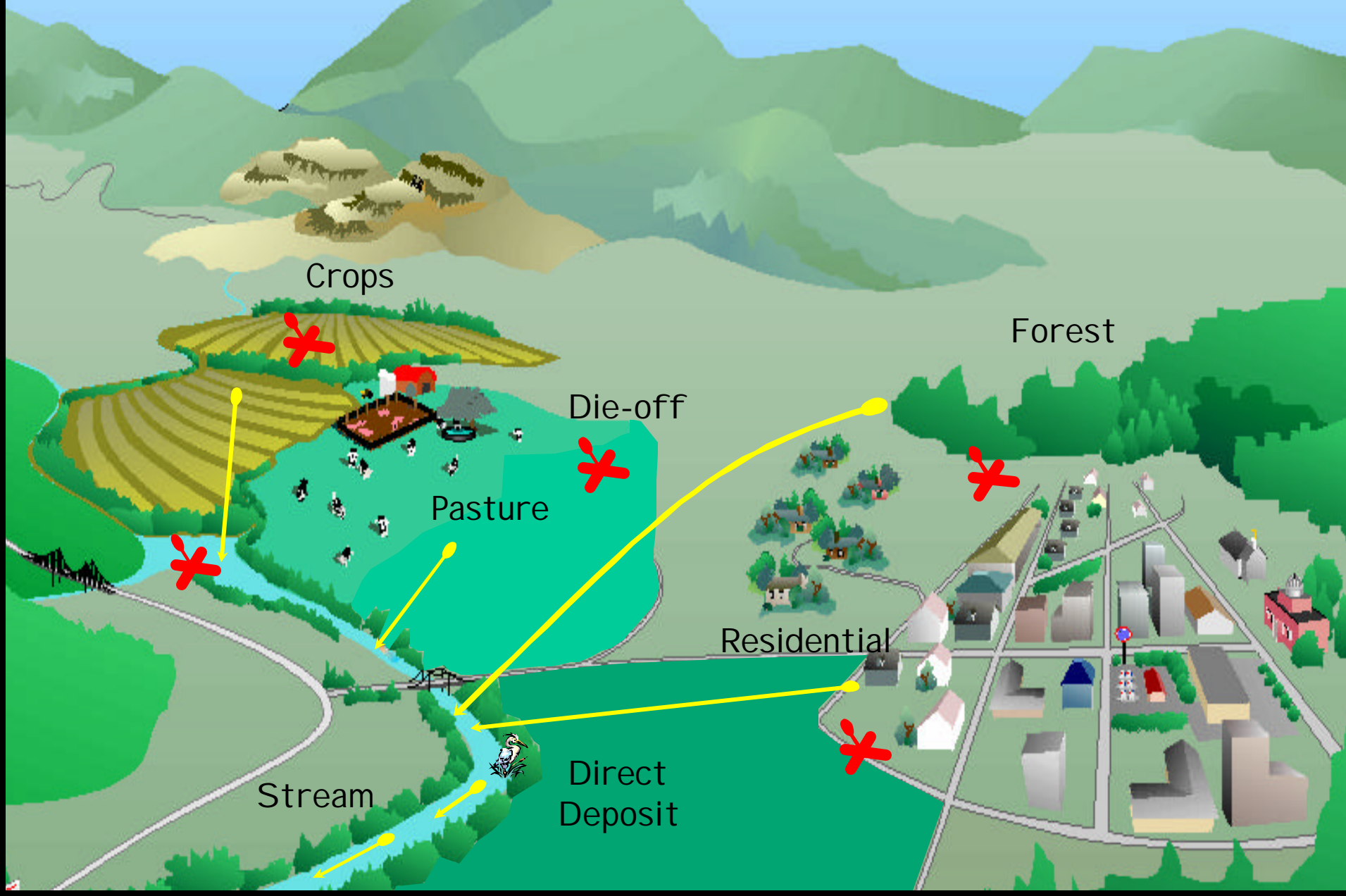
Models are used to predict how watersheds respond and to evaluate pollutant reduction options



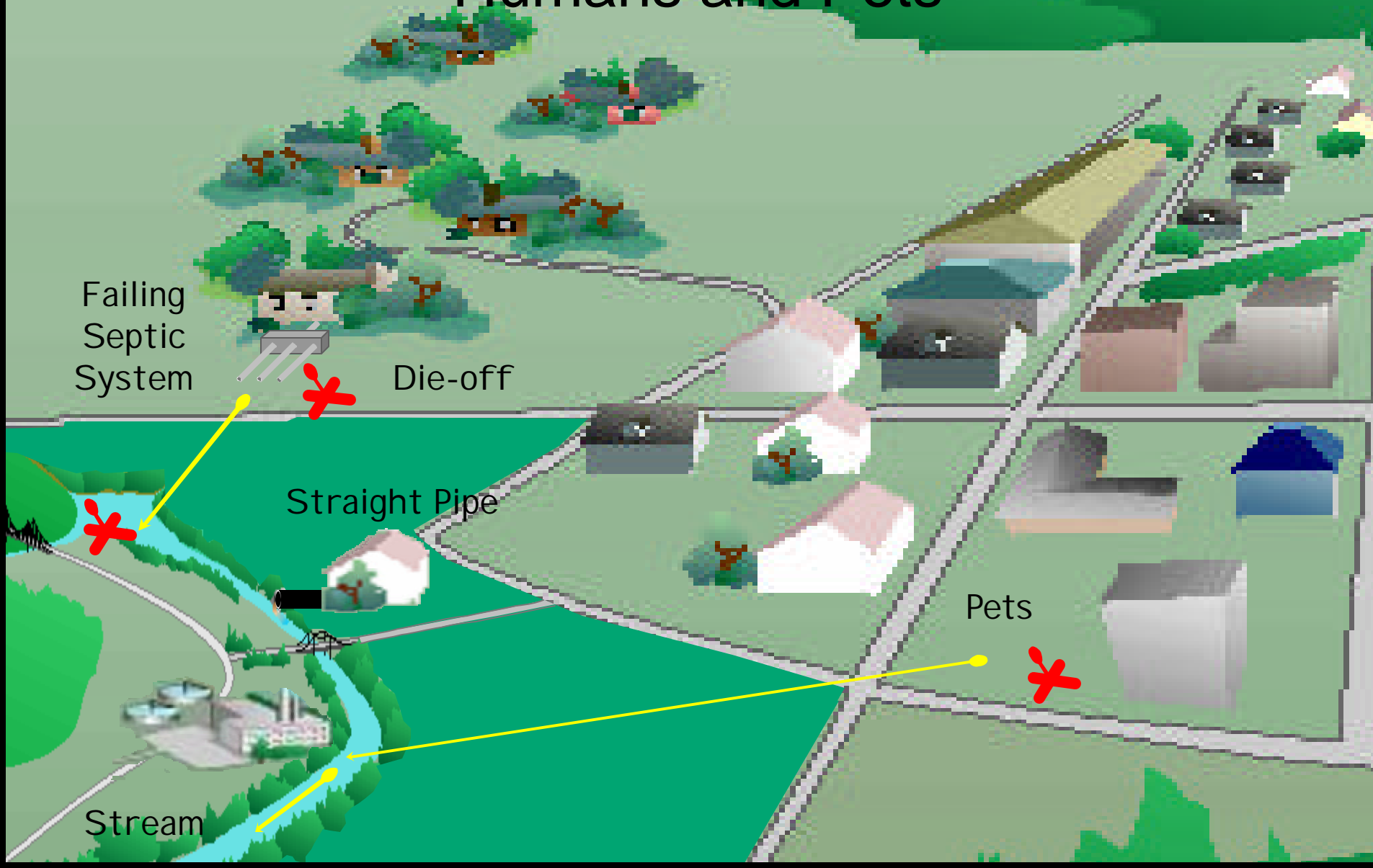
# Fate and Transport of Bacteria: Livestock



# Fate and Transport of Bacteria: Wildlife



# Fate and Transport of Bacteria: Humans and Pets







# Bacteria Load Allocation

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- Identify reductions from existing sources to meet water quality standards
- Consider all sources
  - Direct contributions
    - Permitted point sources
    - Animals in the stream
  - Indirect contributions
    - Septic systems
    - Cropland
    - Pasture
    - Residential/Urban



# What is the Goal?

## Final Allocation Scenarios

Table 1.3. Successful allocation scenarios.

Impaired Watershed	Required Fecal Coliform Loading Reductions to Meet the <i>E coli</i> Standards, %					
	Cattle DD*	Loads from Cropland	Loads from Pasture	Wildlife DD*	Straight Pipes	Loads from Residential
Snow Creek	60	0	95	0	100	95
Story Creek	100	0	85	45	100	75
Upper Pigg River†	100	0	95	5	100	90
Leesville Lake – Pigg River‡	100	0	95	30	100	90
Old Womans Creek	100	0	90	67	n/a	85

\* DD = direct deposit

† Includes reductions for Story Creek applied to the Story Creek portion of the watershed

‡ Includes reductions for Story Creek, Snow Creek, and Upper Pigg River applied to the appropriate portions of the watershed

n/a = not applicable; no straight pipes exist in the Old Womans Creek watershed

# What is the Goal?

## Phase 1 Allocation Scenarios

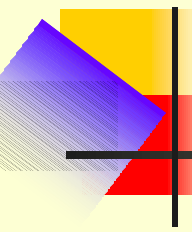
Table 1.5. Allocation scenarios for Stage 1 implementation for the impaired segments.

Impaired Segment	Single Sample Standard Percent Violation	Required Fecal Coliform Loading Reductions to Meet the Stage 1 Goal, %					
		Live-stock DD	Loads from Cropland	Loads from Pasture	Wildlife DD	Straight Pipes	Loads from Residential
Snow Creek	9	5	0	0	0	100	0
Story Creek	8	90	0	0	0	100	0
Upper Pigg River*	9	65	0	0	0	100	0
Leesville Lake - Pigg River†	10	10	0	0	0	100	0
Old Womans Creek	9	100	0	90	0	n/a	85

\*Includes reductions for Story Creek applied to the Story Creek portion of the watershed

†Includes reductions for Story Creek, Snow Creek, and Upper Pigg River applied to the appropriate portions of the watershed

n/a = not applicable; no straight pipes exist in the Old Womans Creek watershed



# Components of a TMDL IP

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- Corrective Actions
- Cost/Benefit Analysis
- Measurable Goals and Milestones
- Timeline to achieve water quality objectives
- Public participation

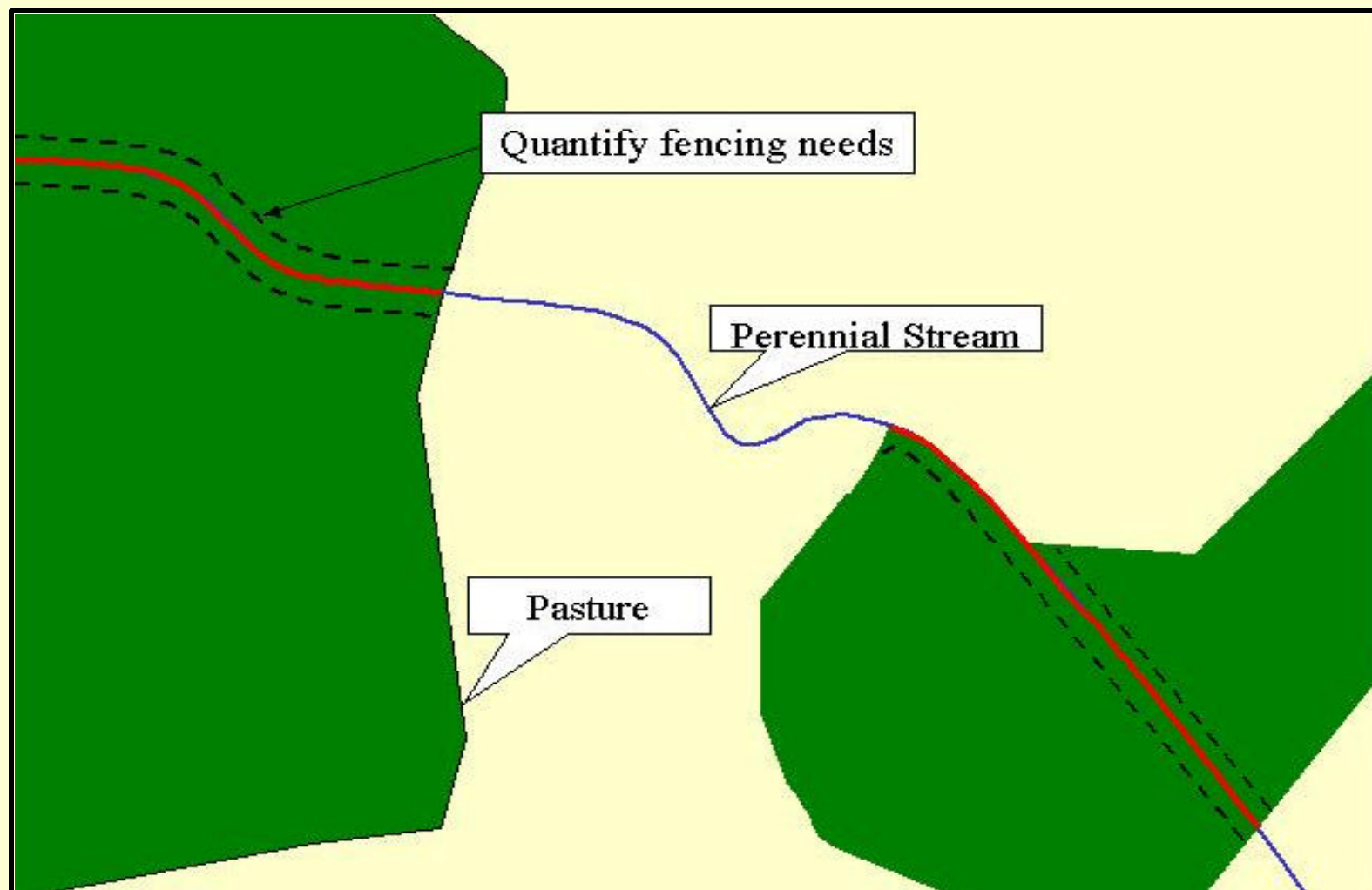
# Corrective Actions – BMPs

- Assess needs
  - TMDL allocations
  - Identify best management practices (BMPs) both existing/potential
- Spatial analysis
- Define resources/constraints
  - financial, time, staff, social...
- Phased approach (targeting)

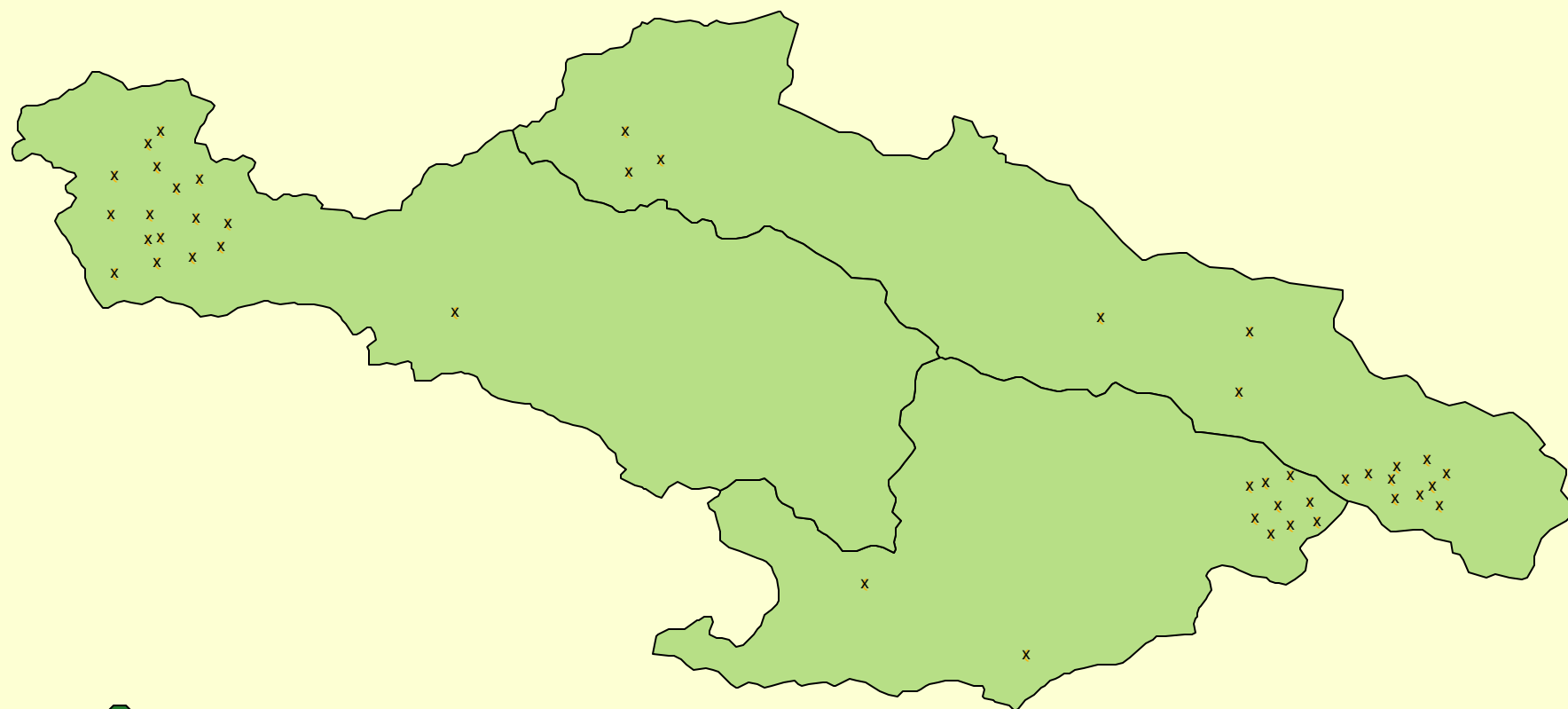


Courtesy VA Department of Conservation and Recreation

# Estimating Fencing Needs



# Targeting Example



● 100 beef livestock



# Cost/Benefit Analysis

- Assess cost for phased/full implementation
- Evaluate environmental benefit
- Identify/evaluate economic

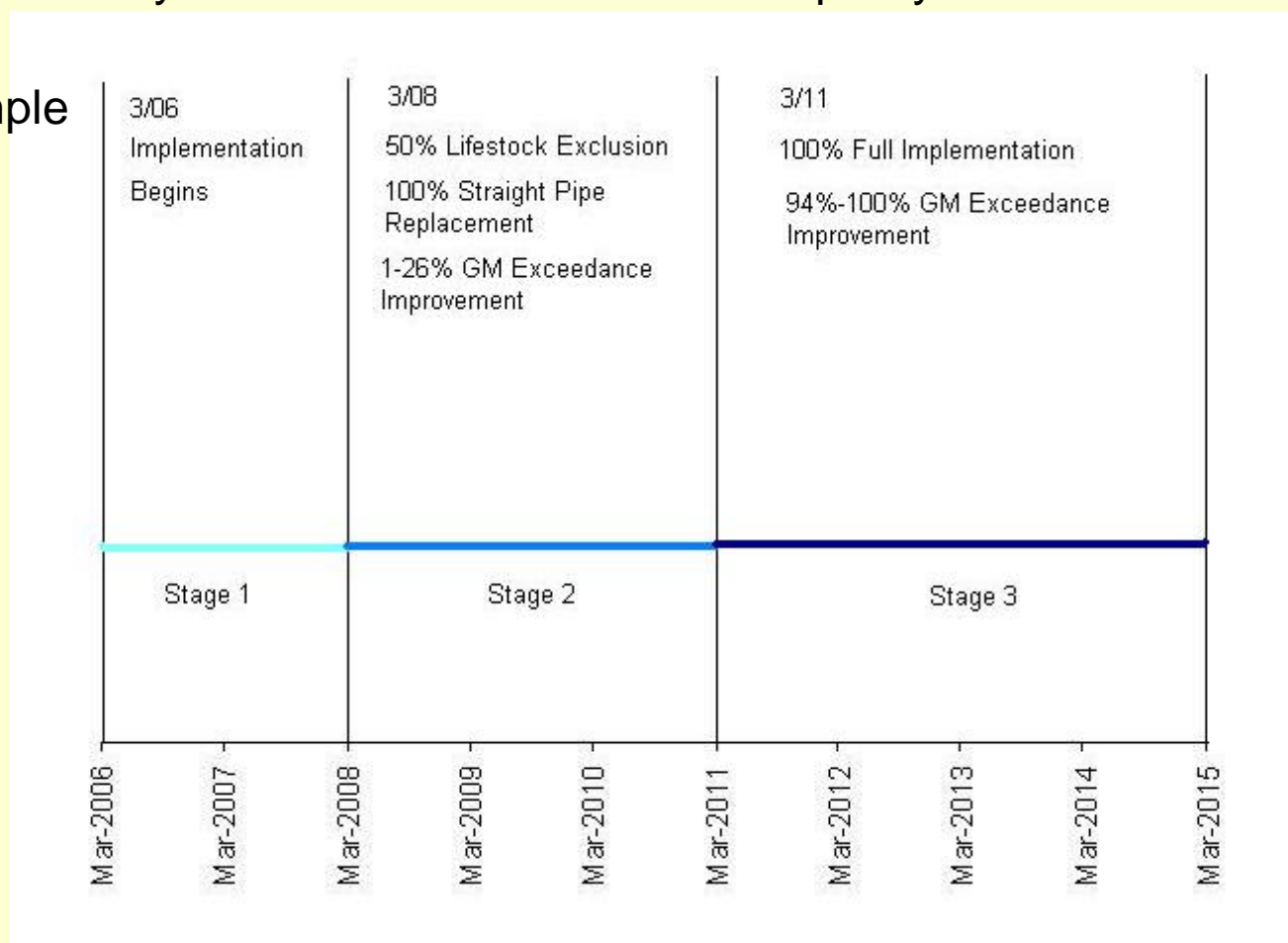
Control Measure	Unit	Estimated Units Needed	Average Cost / Unit (\$)
<i>Agricultural Program:</i>			
Full Exclusion System	system	238	14,128
Cropland Fencing	feet	119,000	1.10
Hardened Crossing	system	117	2,000
Technical Assistance	man-year	15	50,000
Administrative Assistance	man-year	7.5	35,000
<i>Residential Program:</i>			
Septic System	system	7	2,500
Alternative Waste Treatment System	system	8	7,500
Technical Assistance	man-year	1	50,000
Administrative Assistance	man-year	0.5	35,000

Source: VADCR Blackwater River TMDL Implementation Plan

# Measurable Goals/Timeline

- Implementation milestones – stakeholders
- Interim water quality goals – modeling
- 5 – 10 year time frame to meet water quality standard

## Example



# Bacteria Load Allocation – The TMDL

- Identify reductions from existing sources (*i.e. humans, livestock, pets, wildlife*) to meet water quality standards
- Consider all sources
  - Direct contributions
    - Permitted point sources
    - Animals in the stream
  - Indirect contributions
    - Septic systems
    - Cropland
    - Pasture
    - Residential/Urban

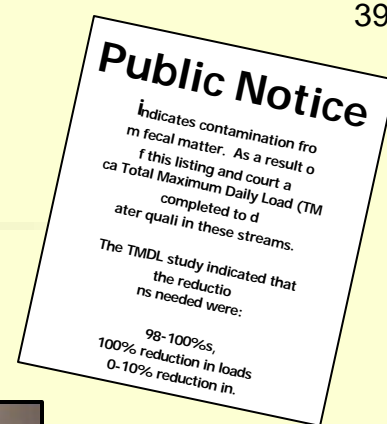
# Public Participation

- Public Meetings
  - Informational
  - Solicit public participation
  - Provide a forum for public comment
- Steering Committee
  - Direct the overall process
  - Review output from working groups
  - Review future implementation
- Working groups
  - Address “community” issues/concerns



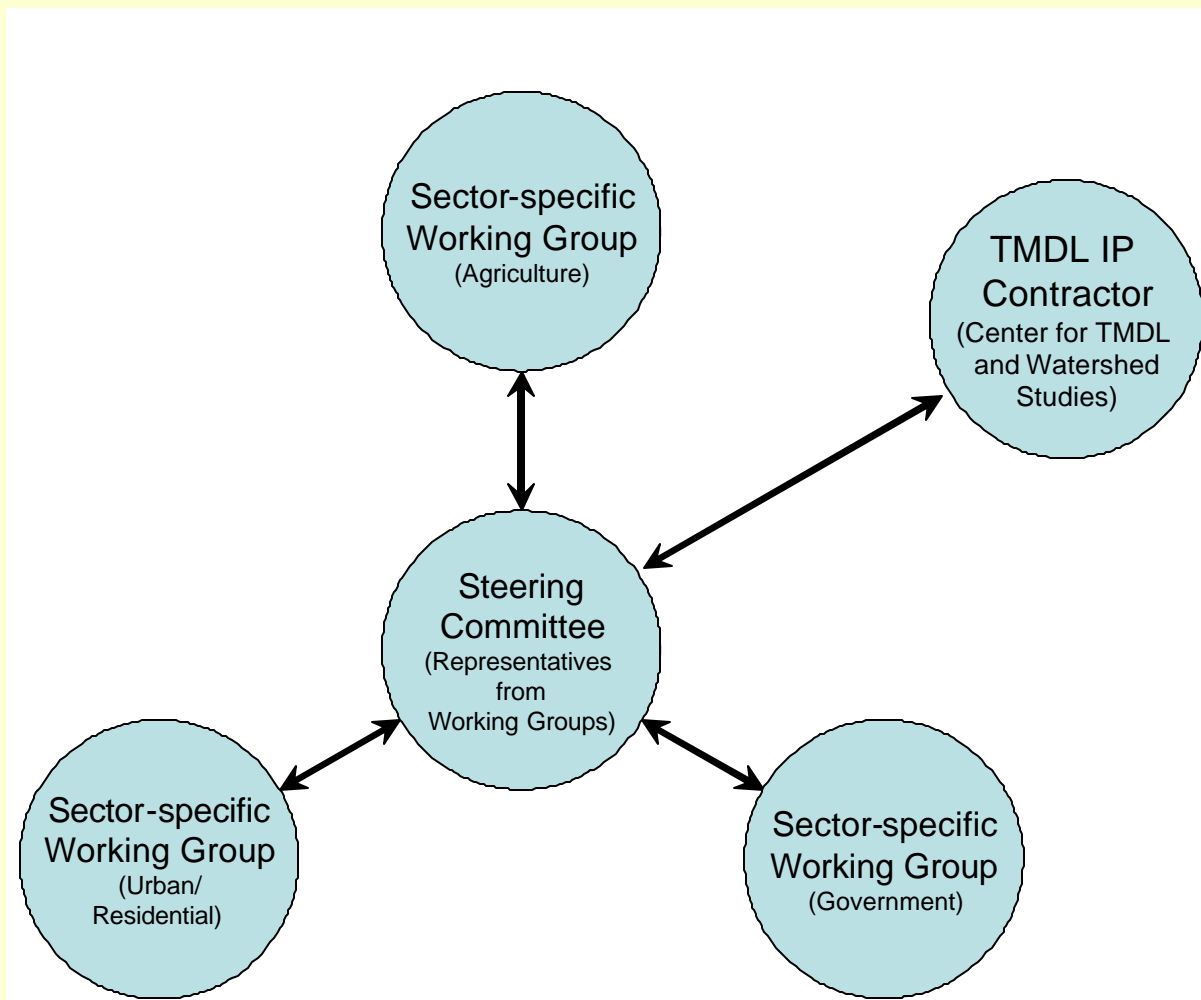
# Public Meetings

- Outreach/notification
  - Mailings, newspapers articles, radio, flyers
- Two Public meetings
  - June 2008
  - December 2008
- Public comment period (30 days)



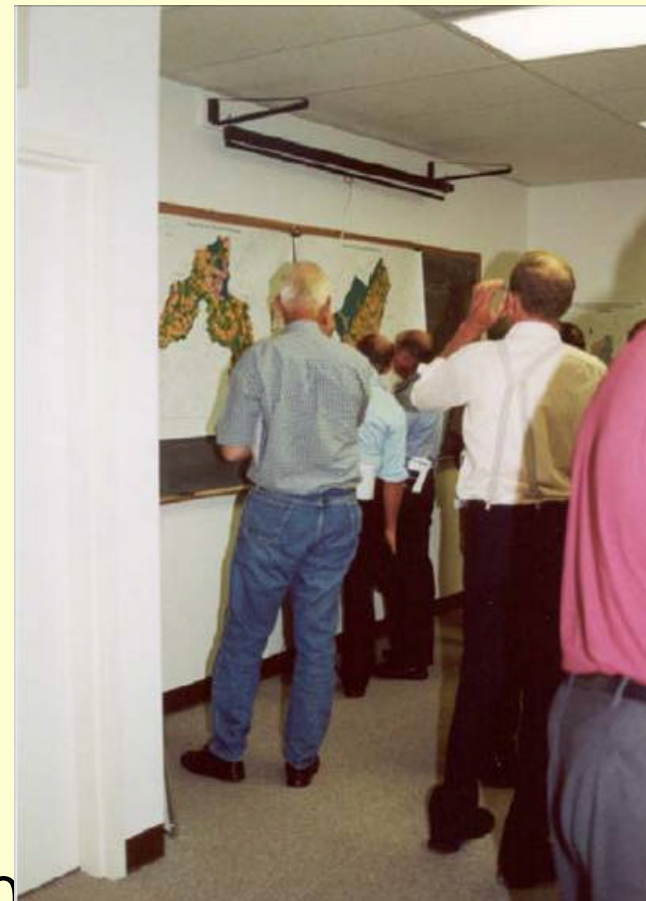


# Stakeholder Interaction Schematic



# Working Groups

- Include:
  - Agriculture
  - Urban/Residential
  - Government
  - Others?
- Meet
  - 1-2 times each
  - Summer – Early Fall 2000



# Agricultural Working Group

- Responsibilities:
  - Identify potential constraints to implementation
  - Identify alternative funding sources/partnerships
  - Review implementation strategies from an agricultural perspective
  - Identify outreach methods for engaging producers



# Urban/Residential Working Group

## ■ Responsibilities

- Identify possible constraints to implementation
- Identify methods of outreach to homeowners sewage problems
- Identify alternative funding sources/partnerships
- Review implementation strategies from a homeowner's perspective

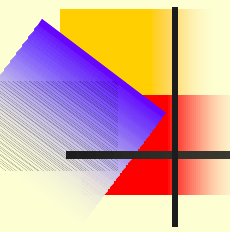




# Government Working Group

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- Responsibilities:
  - Identify funding sources
  - Identify available technical resources
  - Identify appropriate “measurable” goals and timelines
  - Identify existing applicable regulatory controls
  - Identify potential parties to be responsible for implementation

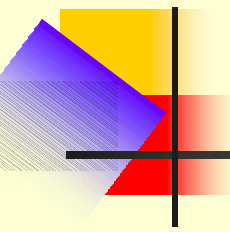


# Steering Committee

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- Includes:
  - DCR, DEQ, Working Group Representatives, NRCS, Dept. of Health, local govt., SWCD, Stakeholders
- Meet: 2-3 meetings during plan development
- Responsibilities
  - Review technical data
  - Assess input from working groups
  - Address community concerns/suggestions
  - Guide the process
    - Are we getting “representative” inputs?
    - How can the process be improved?





# Opportunity to participate

- The development of the Implementation Plan should be a cooperative endeavor that attains consensus.
- All stakeholders will have opportunities to participate through “working groups” and/or the steering committee.

**LOCAL CITIZEN INPUT IS  
CRITICAL !**



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Healthy watersheds  
help prevent flooding  
and protect public  
infrastructure like  
bridges and roads.

Fencing my cattle from  
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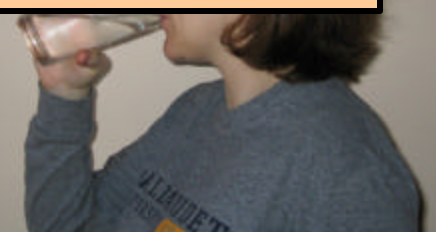
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**A Clean Pigg River is  
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Streams are cool.

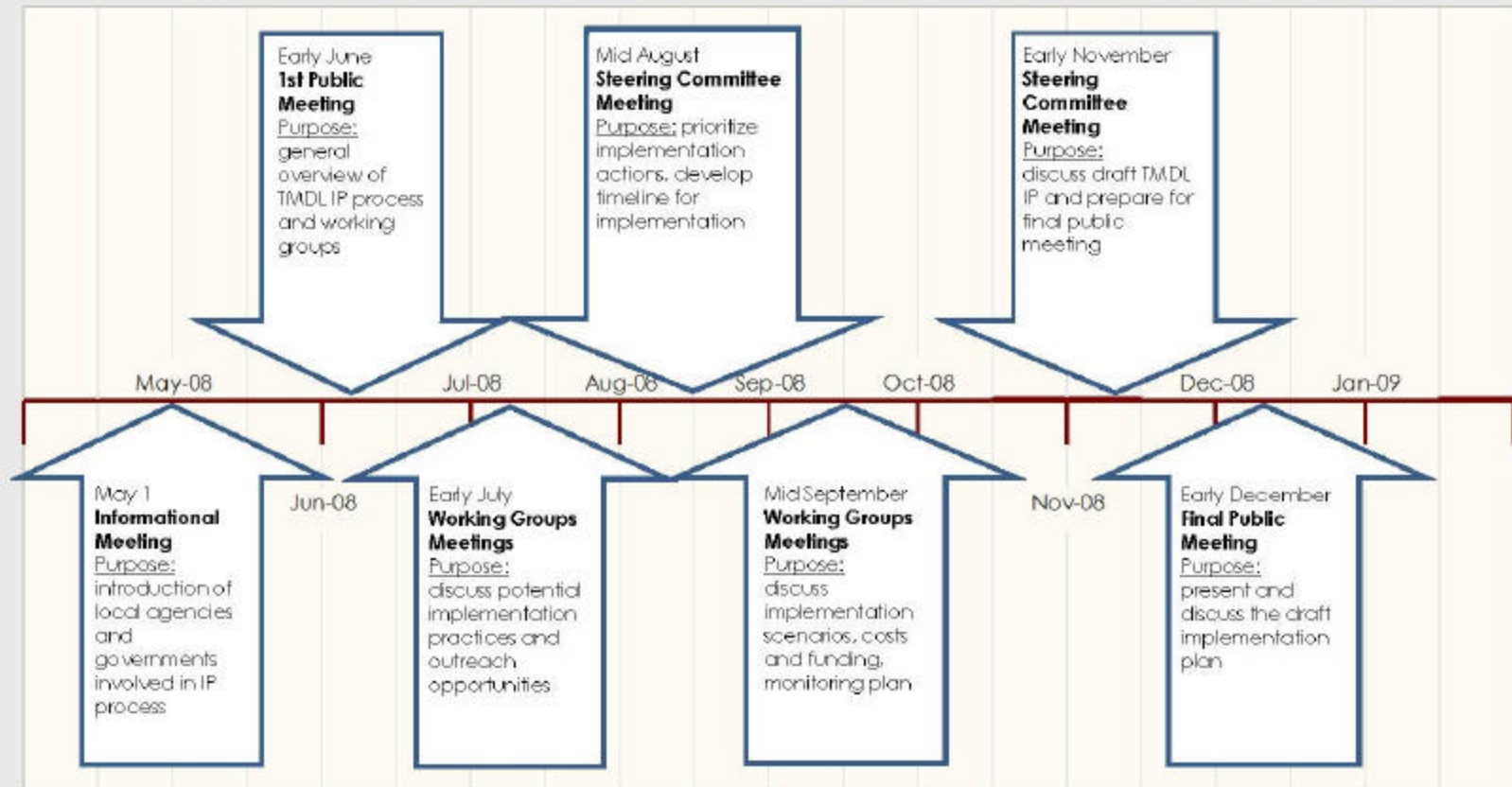


The trees, wildlife and  
open space were  
certainly big factors in  
our decision to pick this  
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paying a little more to  
live closer to nature.



# Where do We go from Here?

## Pigg River TMDL IP Development Proposed Timeline





# Questions or Comments





# Contacts

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